

***Parathozetella microsperma* gen. & sp. nov. from the Brazilian Amazon**

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ABSTRACT—A new genus and species of asexual ascomycete, *Parathozetella microsperma*, are described and illustrated from decaying plant material collected from three rainforest areas in Mato Grosso and Pará States. The new genus resembles *Thozetella* in sporodochial conidiomata, presence of microawns, and enteroblastic monophialidic conidiogenesis that produces lunate conidia, but *Parathozetella* can be easily distinguished by the absence of setulae.

KEY WORDS—*Ascomycota*, saprobic fungi, taxonomy, tropical fungi

Introduction

The Amazon biome, in addition to its great species richness, is also characterized by its high rate of endemism and highly diverse ecosystems

(Veríssimo & al. 2011). The fungal community found on dead and decaying forest litter is crucial for decomposing the organic matter in soil by providing energy and maintaining a nutritional balance. Among the decomposers, asexual ascomycetes are the most common fungi that decompose different plant substrates in both terrestrial (Costa & Gusmão 2016, Santos & al. 2018) and aquatic habitats (Fiuza & al. 2019, Silva & al. 2014).

Data on fungi in the Amazon currently underestimate diversity due to insufficient research (Monteiro & al. 2019, Sotão & al. 2004). Obtaining an accurate assessment of Amazonian biodiversity is further complicated by the threat to the ecosystem caused by the high rate of deforestation and resulting habitat fragmentation (Magnusson & al. 2013). Approximately 200 asexual ascomycete species have been registered in the Brazilian Amazon in the states of Pará (Castro & al. 2012, Monteiro & al. 2013, Santos & al. 2018), Amazonas (Cortez & al. 2016, Fiuza & al. 2015), Amapá (Carmo & al. 2014), and Mato Grosso (Barbosa & al. 2015; 2017). Asexual ascomycetes have also been reported in the Amazon from Peru (Matsushima 1993, Zelski & al. 2014) and Ecuador (Matsushima 1993). As many Amazonian species have yet to be discovered, inventory work is encouraged and essential before we lose these precious forests due to anthropogenic factors such as habitat fragmentation and climate change. Our research team, which has focused on the Brazilian Amazon, has discovered many interesting taxa (Barbosa & al. 2015, 2017, 2019, Fiuza & al. 2015, Monteiro & al. 2013). One survey of asexual ascomycetes on plant debris in Amazonia revealed an interesting sporodochial conidioma-producing fungus with microawns and conidia but lacking setulae. While similar to *Thozetella* Kuntze, the fungus lacked the setulae that characterize this genus. Réblová & Winka (2000) demonstrated the importance of setulae in separating *Dictyochoeta* Speg. and *Codinaea* Maire, a concept supported by Seifert & al. (2011) and Li & al. (2012). Thus, we use the absence of setulae to propose a new genus for the previously undescribed fungus from the Brazilian Amazon.

Materials & methods

Expeditions were carried out to three sites at the Brazilian Amazon rainforest: Cláudia, Mato Grosso (11°34'54"S 55°17'15"W), Parque Nacional do Utinga, Belém, Pará (1°23'13"S 48°25'19"W), and Assentamento Rio Vermelho, Santa Bárbara do Pará, Pará (1°10'58"S 48°11'43"W) to collect decaying wood and petioles. Samples were placed in paper bags and taken to the laboratory at Universidade Federal de Mato Grosso (UFMT-Sinop) and Museu Paraense Emílio Goeldi, Pará for processing following Castañeda-Ruiz & al. (2016). Permanent slides were prepared in PVL resin

(polyvinyl alcohol, lactic acid, and phenol) and reproductive structures were measured and photographed under a Leica DM 500 microscope with a coupled digital camera. The holotype was deposited in the Herbario Centro-Norte Mato-Grossense, Sinop, Mato Grosso state, Brazil (CNMT), and additional materials in the Herbario João Murça Pires, Belém, Pará state, Brazil (MG). Several attempts to obtain this species in pure culture were unsuccessful.

Taxonomy

Parathozetella F.R. Barbosa, J.S. Monteiro, Fiuza, R.F. Castañeda & Gusmão, **gen. nov.**

MB 834624

Differs from *Thozetella* by the absence of setulae on conidia.

TYPE SPECIES: *Parathozetella microsperma* F.R. Barbosa & al.

ETYMOLOGY: Latin, *Para-* referring to similar; and *-thozetella*, referring to the genus *Thozetella*

MYCELIUM superficial and immersed, composed of slightly branched, septate, smooth, pale brown hyphae. CONIDIOMATA sporodochial, superficial, scattered, brown. CONIDIOPHORES macronematous, septate, cylindrical, smooth, pale brown to brown. CONIDIOGENOUS CELLS enteroblastic, monophialidic, integrated, determinate, terminal, cylindrical, smooth, pale brown. MICROAWNS mixed and immersed in the white to yellow conidial mass, smooth or verrucose at one end. CONIDIA lunate, septate or aseptate, smooth, aseptulate, hyaline.

Parathozetella microsperma F.R. Barbosa, J.S. Monteiro, Fiuza, R.F. Castañeda & Gusmão, **sp. nov.**

FIG. 1

MB 834626

Differs from *Thozetella* species by its small conidia that lack setulae.

TYPE: Brazil, Mato Grosso State, Cláudia, on decaying wood of lianes, 9.V.2016, coll. F.R. Barbosa (Holotype, CNMTf 81).

ETYMOLOGY: Latin, *microsperma*, refers to the small size of the conidia

MYCELIUM superficial and immersed, hyphae, 2.5 µm diam, slightly branched, septate, smooth, pale brown. CONIDIOMATA sporodochial, sessile, superficial, scattered, conidial mass white to yellow, 150–320 × 120–200 µm. CONIDIOPHORES macronematous, septate, cylindrical, smooth, pale brown to brown. CONIDIOGENOUS CELLS enteroblastic, monophialidic, integrated, determinate, terminal, cylindrical, smooth, subhyaline, 8.5–13 × 2–3 µm, with a conspicuous collarette. MICROAWNS aseptate, uncinata, verrucose at one end, hyaline, mixed and immersed in the white to yellow conidial mass, 10–12 ×

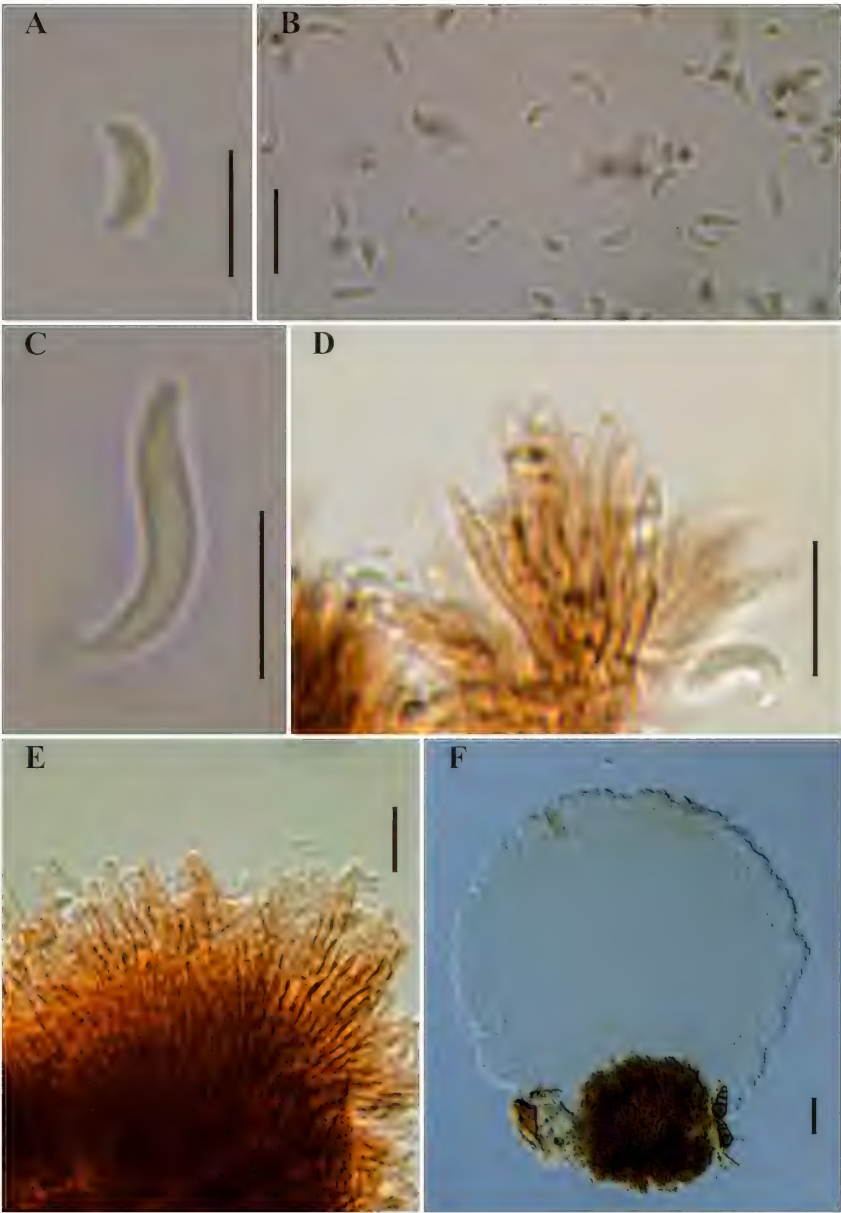


FIG. 1. *Parathozetella microsperma* (holotype, CNMTf 81). A. Conidium; B. Conidia; C. Microawn; D. Conidiogenous cells and microawn; E. Conidiogenous cells; F. Conidiomata. Scale bars: A, C = 5 μ m; B, D–E = 10 μ m; F = 20 μ m.

1.2–1.5 μm . CONIDIA lunate, 0–1 septate, smooth, aseptulate, hyaline, 4–5 $\times$ 1–1.5 μm . Sexual morph not observed.

ADDITIONAL SPECIMENS EXAMINED—BRAZIL. PARÁ STATE: Belém, Parque Estadual do Utinga, trilha do Patuá, on decaying wood of unidentified plant: 29.IV.2019, coll. J.S. Monteiro (MG 237232). Santa Bárbara do Pará, Assentamento Rio Vermelho, on decaying petioles of *Bactris gasipaes* Kunth (*Arecaceae*), 16.V.2019, coll. A.P. Silva (MG 237239).

COMMENTS—The production of sporodochia with monophialidic conidiogenous cells invites comparison of *Parathozetella* with some genera like *Mahabalella* B. Sutton & S.D. Patil, *Menidochium* R.F. Castañeda & W.B. Kendr., and *Minimidochium* B. Sutton. However, the presence of microawns distinguishes *Parathozetella* from those genera, placing it morphologically closer to *Thozetella*. In addition to forming conidioma (synnema and sporodochia) and microawns, however, *Thozetella* is further characterized by conidia with setulae, structures that are absent in *Parathozetella*.

We consider that production of microawns and aseptulate conidia are sufficient to propose a new genus, possibly within *Chaetosphaeriaceae*, a family characterized by presence of microawns. Réblová (2000) and Réblová & Winka (2000) maintained that the presence or absence of conidial setulae was morphologically important in separating *Dictyochaeta* and *Codinaea*. Moreover, Seifert & al. (2011) and Li & al. (2012) also accepted using conidial setulae as a factor in delineating genera. Given this result we suggest establishing a new genus and species *Parathozetella microsperma* for our fungus from the Brazilian Amazon.

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